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Does Private Investment Reduce Unemployment? Evidence From Vietnam

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Abstract: This study analyzes the dynamic relationship between private sector investment and the unemployment rate in Vietnam during 1996 - 2024 by employing an Autoregressive Distributed Lag (ARDL) model. Using time-series data on unemployment, private investment, GDP growth, and inflation, this study evaluates both the short- and long-run impacts. The empirical findings confirm the existence of a long-run cointegrating relationship among the variables in which private investment and economic growth play a significant role in reducing unemployment over time. Although the short-term effects are less pronounced, the error correction term indicates a substantial adjustment speed toward long-run equilibrium. These findings align with those of previous studies on developing countries, underscoring the crucial role of private investment in job creation, particularly under transparent institutional conditions and macroeconomic stability. Conversely, inflation shows no significant short-term effect, but exerts a notable long-run influence. This study fills an empirical gap in Vietnam by simultaneously examining the interrelated effects of investment, growth, and inflation on the labor market. Accordingly, this study proposes policy recommendations to enhance the investment environment, integrate employment objectives into private sector development strategies, and maintain macroeconomic stability to promote sustainable job creation in line with Sustainable Development Goal 8.

Keywords: Private investment; Unemployment rate; Economic growth; ARDL model; Employment policy.
JEL codes: E22; J64; C32; E24; O11

I. Introduction

In the context of a rapidly transforming global economy driven by trends such as digital transformation, automation, and sustainable development, one of the major challenges for developing countries such as Vietnam is the simultaneous promotion of economic growth and sustainable employment for a growing labor force. In particular, the unemployment rate, an important indicator of the efficiency of economic performance, remains a key concern in macroeconomic policymaking.

In Vietnam, the private sector has increasingly asserted its central role in driving growth, contributing to over 40% of the country's GDP and generating more than 85% of employment in the economy (General Statistics Office, 2023). However, the relationship between private investment and the unemployment rate has not yet been thoroughly clarified in both theoretical and empirical terms, especially with regard to short- and long-run dynamics. Determining whether private investment truly contributes to reducing unemployment is essential for policymakers to design appropriate development strategies and effectively support the labor market.

According to Solow's (1956) growth theory, economic growth depends on three key factors: capital, labor, and total factor productivity. Private investment increases the capital stock in the economy, thereby stimulating growth and indirectly creating employment opportunities. In the extended model of Mankiw et al., (1992), human capital is also incorporated as a determinant of growth, further illustrating the link between investment, employment, and productivity. As the private sector expands production, particularly in high value-added industries, such as high-tech manufacturing, financial services, and the digital economy, it tends to generate higher-quality employment for the workforce.

Stiglitz (2002) emphasizes that the labor market does not self-adjust to equilibrium, as assumed by classical models. High unemployment rates can persist in the absence of appropriate economic and social policies. Thus,

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the private sector serves as an effective policy transmission channel. When properly incentivized, it can expand production, attract labor, and invest in skill development, thus reducing structural and skills-mismatched unemployment.

Moreover, Porter (2011) argued that modern private enterprises no longer pursue profit as their sole objective but also aim to create shared value through business strategies aligned with sustainable development. When companies invest in green technologies, workforce training, or socially responsible product development, they simultaneously generate positive impacts on both the labor market and the broader society. This is particularly relevant for countries such as Vietnam, where the labor market faces persistent challenges, such as youth unemployment, skill shortages, and a high prevalence of informal employment.

However, in practice, the relationship between private investment and unemployment is not always clear or immediate. International studies, such as Ho (2018), suggest that the unemployment-reducing effect of private investment tends to be more pronounced in the long run once investment projects begin to yield results and spill over into the labor market. By contrast, short-run effects may be offset by factors such as business cycles, policy fluctuations, or the labor market's absorption capacity.

In Vietnam, national statistics indicate that the overall unemployment rate has remained relatively stable in recent years, hovering below 2.5% (General Statistics Office, 2023). However, youth unemployment, informal employment, and underemployment remain high, signaling unresolved challenges in job quality and employment sustainability. Meanwhile, private investment has accounted for an increasing share of total social investment; however, few empirical studies have quantitatively assessed its impact on the labor market.

Therefore, the study titled "The Impact of Private Investment on Unemployment in Vietnam" provides significant theoretical and practical contributions. It seeks to answer the following key questions: Does private investment help reduce unemployment in Vietnam in the short and long run? How does its impact compare to other macroeconomic factors such as GDP growth or inflation? Based on these findings, this study proposes policy recommendations for promoting the private sector and sustainably reducing unemployment.

This study not only addresses a research gap in the Vietnamese context, but also provides empirical evidence to support the revision and improvement of policies aimed at fostering private sector development in an inclusive and sustainable manner. As Vietnam implements its Socio-Economic Development Strategy for 2021–2030, which emphasizes the private sector as a "pillar" of the economy, further research into the sector's impact on key development indicators, particularly unemployment, is both timely and essential. This forms a crucial foundation for achieving the United Nations Sustainable Development Goal 8 on "inclusive economic growth and decent work for all" (UNDP, 2023).

II. Literature Review

The relationship between private investment and unemployment has long been a subject of significant interest in the field of economics, particularly as the global economy strives to recover from major shocks, such as financial crises, the COVID-19 pandemic, and cyclical fluctuations. Economic growth theories, including endogenous growth theory (Romer, 1990; Aghion & Howitt, 1994) and labor market theory (Mortensen & Pissarides, 1994), emphasize the central role of private investment in enhancing productivity, expanding production capacity, and consequently increasing labor demand.

Recent empirical studies provide evidence that private investment, economic growth, and inflation exert both direct and indirect effects on the unemployment rate. For instance, Okorie and Allison (2022), using an ARDL model in Nigeria, found that a 1% increase in private investment leads to a significant reduction in unemployment by 5.5% in the short run and 17.1% in the long run. These findings reinforce the critical role that the private sector plays in promoting employment, particularly in developing economies.

In their analysis of emerging Asian economies, Dabla-Norris et al. (2015) find that private investment contributes to reducing unemployment, but its effectiveness is maximized only in the presence of strong institutional frameworks. By contrast, in environments with weak legal transparency, private investment may lead to labor substitution through technology, thereby increasing structural unemployment.

From a business cycle perspective, Auerbach and Gorodnichenko (2017) showed that during economic recovery, private investment significantly boosts labor demand. However, this effect diminishes sharply during recessions in the absence of complementary aggregate demand–support policies.

Recent contributions from developing regions further enrich the literature: Sami (2025), using a panel ARDL model for North African countries, found that both foreign direct investment (FDI) and GDP have significant long-run unemployment-reducing effects. Similarly, Cao et al., (2025), in a study of Saudi Arabia, reported that GDP, FDI, and inflation negatively affect unemployment, with inflation having the strongest impact, suggesting that price control policies could effectively support employment.

Tabash et al., (2025), focusing on BRICS countries, emphasized that public–private partnerships (PPPs) and fixed capital investment reduce unemployment, particularly when linked to energy and sustainable development projects. For the ASEAN region, Hidthiir et al., (2024), using a 40-year dataset, showed that private investment

and inflation indirectly influence unemployment through GDP growth, clearly illustrating a transmission mechanism aligned with Okun (1962).

In the Vietnamese context, Dao et al., (2023), using provincial-level data, find that FDI contributes to promoting formal employment, particularly in key economic zones. Similarly, Demombynes and Testaverde (2018) analyzed labor force survey data from 2007 to 2014 and revealed that employment surged in the private sector, especially among FDI enterprises. As this sector expands, workers' incomes increase, which, in turn, improves household consumption and raises labor demand, ultimately creating more jobs and reducing unemployment.

In addition, Hjazeen et al., (2021) in Jordan and Ahamed (2021) across 39 developing countries confirmed that GDP growth is an important mediating factor in the relationship between investment and labor market. Kitov (2021) further demonstrated that GDP per capita is a reliable predictor of the unemployment rate, reinforcing the importance of GDP as a core variable in unemployment modeling.

Despite a growing number of international and regional studies examining the effects of private investment, GDP, and inflation on unemployment, there remains a lack of updated quantitative analyses in the Vietnamese context using the ARDL model to simultaneously assess both short- and long-run relationships among these variables. Notably, no existing research has jointly analyzed the combined effects of private investment, GDP growth, and inflation on unemployment, nor has it evaluated the adjustment speed toward a long-run equilibrium through the error correction term (ECT). Moreover, the mediating role of economic growth in transmitting the effects of private investment and inflation on unemployment in Vietnam has not yet been empirically tested.

Therefore, this study not only clarifies the individual contributions of each variable in both the short and long run but also fills a significant empirical gap. It provides scientific evidence to inform policy formulation aimed at promoting private sector development, controlling inflation, and creating sustainable employment, as Vietnam continues its path of economic recovery and structural transformation.

III. Research Methodology

The data used in this study were collected from the General Statistics Office of Vietnam and World Bank. A detailed description of these variables is presented in Table 1.

Table 1. Description of Variables

Acronyms	Description	Sources
UER	Unemployment total (% of total labor force)	https://databank.worldbank.org/source/world-development-indicators#
INF	Inflation (annual %)	
GDP	Gross Domestic Product Growth (annual %)	
PSI	Private Sector Investment (annual %)	Vietnam Statistical Yearbook (1996 - 2024)

Source: Compiled by the authors.

Based on the above literature review and building upon the findings of previous empirical studies, this study proposes the following model for Vietnam:

$$UER_t = \alpha_0 + \alpha_1 PSI_t + \alpha_2 GDP_t + \alpha_3 INF_t + \varepsilon_t \quad (1)$$

The autoregressive distributed lag (ARDL) model was selected for this study because of its notable ability to simultaneously estimate both short- and long-run relationships among variables in time series data. This characteristic is particularly well suited to the nature of macroeconomic data, which often exhibit nonstationarity and fluctuations over time. Unlike traditional regression methods that require all variables to be integrated in the same order, the ARDL approach allows for the inclusion of variables with different orders of integration, provided that none are integrated of order two (I(2)). This flexibility broadens the applicability of the model, particularly in the context of analyzing real-world macroeconomic time-series data.

The ARDL model was developed by Pesaran et al., (2001) and has since been widely applied in empirical studies to analyze the relationships among macroeconomic indicators. One of the key advantages of the ARDL approach is its ability to test for cointegration among variables using the Bounds Testing procedure, even when the variables are integrated of different orders. This feature is particularly valuable when working with macroeconomic data in Vietnam, where variables often exhibit nonstationary characteristics and may be integrated at different levels.

Moreover, the ARDL model is an unrestricted dynamic model in which the dependent variable is expressed as a function of its own lagged values and those of independent variables. This structure allows the model to flexibly capture the effects of past economic shocks on current outcomes, thereby providing reliable estimates of both short- and long-term relationships. Additionally, the ARDL model can be applied to both large and small sample sizes and remains robust, even in the presence of endogeneity in some independent variables (Adom et al., 2018).

The quantitative analysis using the ARDL approach involves the following steps. First, the optimal lag length is determined using information criteria such as AIC, SC, HQ, LR, and FPE. Second, the stationarity of

the variables was tested using Correlogram Analysis. Third, the cointegration relationship among variables was examined using the bounds test. If the calculated F-statistic exceeds the critical value for the upper bound (I(1)), it indicates the presence of a long-term relationship. Fourth, the ARDL model is estimated based on the selected lag structure, followed by the estimation of an error correction model (ECM) to assess the speed of adjustment toward long-run equilibrium after short-run shocks, in accordance with Engle and Granger (1987). Finally, post-estimation diagnostic tests are conducted to evaluate the reliability and robustness of the regression results.

Overall, the ARDL model provides a robust and flexible methodological framework for analyzing complex relationships in macroeconomics, particularly suitable for data characterized by heterogeneous integration orders and limited sample sizes, as is the case for Vietnam.

The ARDL regression model employed in this study is specified as follows:

$$DUER_t = \beta_0 + \sum_{i=>1} \beta_1 DUER_{t-i} + \sum_i \beta_2 DPSI_{t-i} + \sum_i \beta_3 DGDP_{t-i} + \sum_i \beta_4 DINF_{t-i} + \lambda_1 UER_{t-1} + \lambda_2 PSI_{t-1} + \lambda_3 GDP_{t-1} + \lambda_4 INF_{t-1} + \varepsilon_{it} \quad (2)$$

The long-run model is rewritten as follows:

$$UER_t = \beta_0 + \lambda_1 UER_{t-1} + \lambda_2 PSI_{t-1} + \lambda_3 GDP_{t-1} + \lambda_4 INF_{t-1} + \varepsilon_{1t} \quad (3)$$

The short-run model is:

$$DUER_t = \beta_0 + \sum_{i=>1} \beta_1 DUER_{t-i} + \sum_i \beta_2 DPSI_{t-i} + \sum_i \beta_3 DGDP_{t-i} + \sum_i \beta_4 DINF_{t-i} + \varepsilon_{2t} \quad (4)$$

Evaluation of the Error Correction Model (ECM):

$$DUER_t = \beta_0 + \sum_{i=>1} \beta_1 DUER_{t-i} + \sum_i \beta_2 DPSI_{t-i} + \sum_i \beta_3 DGDP_{t-i} + \sum_i \beta_4 DINF_{t-i} + \psi ECM_{t-i} + \varepsilon_{3t} \quad (5)$$

The Error Correction Model (ECM) is a key econometric tool used to analyze the dynamic short-run relationships among economic variables, while accounting for the long-run equilibrium established through cointegration. One of the central components of ECM is the error correction coefficient, commonly denoted as ψ (psi). This parameter reflects the speed at which the dependent variable returns to its long-run equilibrium after short-term deviation. A statistically significant and negative ψ value indicates that the system converges toward equilibrium over time, confirming the existence of a stable long-run relationship among the variables.

Specifically, if the value of ψ is negative and statistically significant, this indicates the presence of a self-correcting mechanism within the system. When the dependent variable is affected by short-term shocks and deviates from its long-run equilibrium, it gradually adjusts to return to the equilibrium level at a rate determined by the magnitude of ψ. The larger the absolute value of ψ, the faster is the adjustment process, reflecting the strong capacity of the system to recover from short-term fluctuations. Conversely, if ψ is not statistically significant or is non-negative, the dependent variable lacks a tendency to revert to equilibrium, suggesting that the long-run relationship among the variables may be unstable or non-existent.

As such, the ECM serves as a critical bridge between theory and empirical analysis, enabling researchers to assess both short-run dynamics and the system's long-run stability, especially in the context of non-stationary time-series data that exhibit cointegrated relationships.

IV. Regression Results

Table 2 presents the descriptive statistics for the four variables used in the research model.

Table 2. Descriptive Statistics of the Variables

	UER	PSI	GDP	INF
Mean	1.905655	18.42993	6.425931	5.611241
Median	2.026000	13.46000	6.690000	3.831000
Maximum	2.870000	94.11300	9.340000	23.11500
Minimum	0.999000	2.731000	2.554000	-1.710000
Std. Dev.	0.495324	18.26900	1.446947	5.086510
Skewness	-0.255569	2.795730	-0.818171	1.877833
Kurtosis	2.405998	11.45007	4.270390	7.122143
Sum	55.26400	534.4680	186.3520	162.7260
Sum Sq. Dev.	6.869687	9345.178	58.62236	724.4322
Observations	29	29	29	29

Source: Compiled by the authors using EViews software.

The descriptive statistics for the four variables used in the model–unemployment rate, private investment, economic growth, and inflation–were based on 29 observations. First, the unemployment rate has an average value of 1.91% with a low standard deviation of 0.495, indicating mild fluctuations around the mean. It

also shows a slight negative skewness (-0.25) and kurtosis of 2.40, suggesting a distribution that is approximately normal.

The private investment variable exhibits significant volatility, with a high standard deviation of 18.27 and a maximum value of 94.11, indicating that certain years experienced exceptional surges in investment. By contrast, GDP growth averages 6.43% with a relatively low standard deviation of 1.44, reflecting stable growth over time.

Inflation showed the highest level of variability among all variables, with a standard deviation of 5.09, maximum of 23.11%, and minimum of -1.71%. This highlights the considerable price fluctuations during the study period.

Overall, the descriptive statistics reveal that the variables have different distributional characteristics, with PSI (private investment) and INF (inflation) showing high dispersion, whereas UER (unemployment rate) and GDP demonstrate greater stability. These statistical features provide an important basis for selecting an appropriate econometric methodology to ensure the reliability of analytical results.

Table 3 presents the correlation matrices for the variables used in the research model.

Table 3. Correlation Matrix of the Variables

	UER	**PSI**	**GDP**	**INF**
UER	1.000000	-0.191063	-0.061362	-0.245051
PSI	-0.191063	1.000000	0.192869	0.128709
GDP	-0.061362	0.192869	1.000000	-0.023277
INF	-0.245051	0.128709	-0.023277	1.000000

Source: Compiled by the authors using EViews software.

The results show the correlation matrix of the variables used in the model. Overall, the absolute values of the correlation coefficients were relatively low, suggesting weak relationships between the variables and a low likelihood of severe multi-collinearity. Specifically, the unemployment rate (UER) exhibits a mild negative correlation with private investment (PSI) at -0.191063, GDP growth at -0.061362, and inflation (INF) at -0.245051. This finding implies that increases in private investment, GDP growth, or inflation are generally associated with a decrease in unemployment, although the relationships are weak.

Private investment (PSI) shows a slight positive correlation with GDP (0.192869) and inflation (0.128709), indicating a tendency for investment to rise alongside economic growth and inflation. GDP has virtually no significant correlation with inflation (-0.023277), suggesting that inflationary fluctuations in the sample do not significantly influence economic growth.

In summary, the correlation matrix revealed a relatively high degree of independence among the variables, supporting their inclusion in a multivariate regression model without significant concerns about multicollinearity.

Table 4 presents the optimal lag length selection for the model based on the statistical criteria, including LR, FPE, AIC, SC, and HQ.

Table 4. Optimal Lag Length Selection

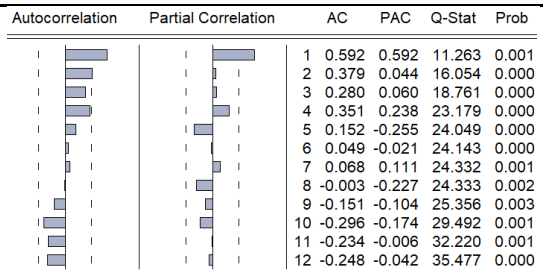
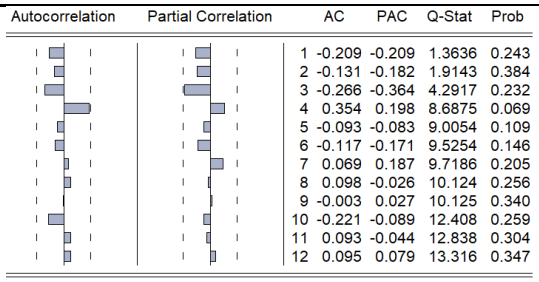
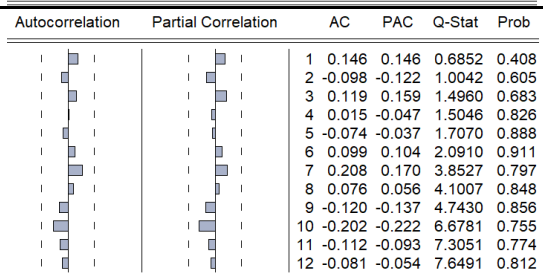
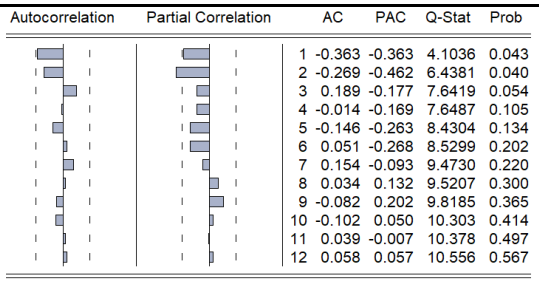
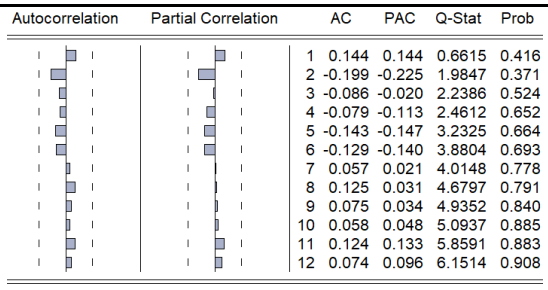
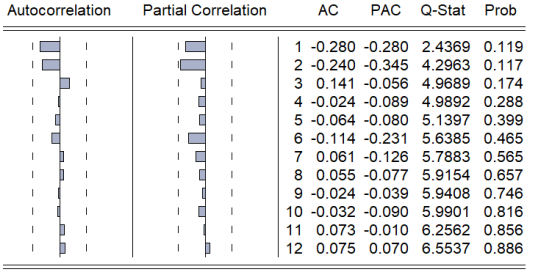
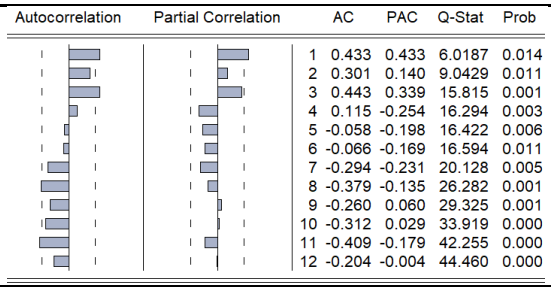
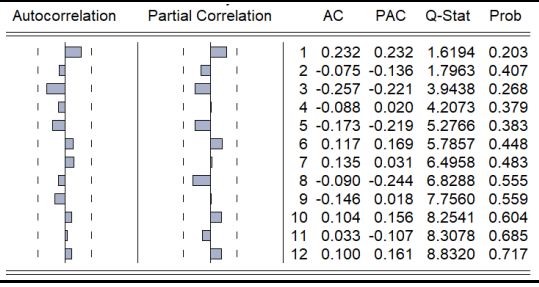
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-271.5816	NA	4158.937	19.68440	19.87472*	19.74258
1	-249.1172	36.90582*	2661.464*	19.22266*	20.17423	19.51356*

Source: Compiled by the authors using EViews software.

Four criteria, LR, FPE, AIC, and HQ, suggest that a lag length of 1 is optimal, as indicated by the improved statistical values compared to lag 0. Specifically, the FPE value decreased from 4158.937 to 2661.464, AIC decreased from 19.68440 to 19.22266, and HQ decreased from 19.74258 to 19.51356 at lag 1. The LR test, with a value of 36.90582, also supports lag 1 with strong statistical significance. Although the SC criterion recommends lag 0, it tends to favor more parsimonious models and may underestimate the necessary lag length. Therefore, based on the majority of selection criteria, it can be concluded that a lag length of 1 is optimal for the model, ensuring both model adequacy and accuracy in time-series analysis.

Before applying the ARDL Bounds Testing approach, unit root tests must be conducted as a prerequisite to determine the integration order of the time-series variables. The stationarity of variables was assessed using a correlogram analysis method. As shown in Table 5, PSI and GDP are stationary at level, while the remaining two variables are stationary at the first difference. These integration characteristics confirm the appropriateness of the ARDL model as it allows for the inclusion of variables with mixed integration orders, facilitating the analysis of both short- and long-run relationships among the variables in the model.

Table 5. Unit Root Test Results of the Variables

Variables	I(0)	I(1)
UER		
PSI		
GDP		
INF		

	Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
UER			1	0.592	0.592	11.263	0.001
			2	0.379	0.044	16.054	0.000
			3	0.280	0.060	18.761	0.000
			4	0.351	0.238	23.179	0.000
			5	0.152	-0.255	24.049	0.000
			6	0.049	-0.021	24.143	0.000
			7	0.068	0.111	24.332	0.001
			8	-0.003	-0.227	24.333	0.002
			9	-0.151	-0.104	25.356	0.003
			10	-0.296	-0.174	29.492	0.001
			11	-0.234	-0.006	32.220	0.001
			12	-0.248	-0.042	35.477	0.000
PSI			1	0.146	0.146	0.6852	0.408
			2	-0.098	-0.122	1.0042	0.605
			3	0.119	0.159	1.4960	0.683
			4	0.015	-0.047	1.5046	0.826
			5	-0.074	-0.037	1.7070	0.888
			6	0.099	0.104	2.0910	0.911
			7	0.208	0.170	3.8527	0.797
			8	0.076	0.056	4.1007	0.848
			9	-0.120	-0.137	4.7430	0.856
			10	-0.202	-0.222	6.6781	0.755
			11	-0.112	-0.093	7.3051	0.774
			12	-0.081	-0.054	7.6491	0.812
GDP			1	0.144	0.144	0.6615	0.416
			2	-0.199	-0.225	1.9847	0.371
			3	-0.086	-0.020	2.2386	0.524
			4	-0.079	-0.113	2.4612	0.652
			5	-0.143	-0.147	3.2325	0.664
			6	-0.129	-0.140	3.8804	0.693
			7	0.057	0.021	4.0148	0.778
			8	0.125	0.031	4.6797	0.791
			9	0.075	0.034	4.9352	0.840
			10	0.058	0.048	5.0937	0.885
			11	0.124	0.133	5.8591	0.883
			12	0.074	0.096	6.1514	0.908
INF			1	0.433	0.433	6.0187	0.014
			2	0.301	0.140	9.0429	0.011
			3	0.443	0.339	15.815	0.001
			4	0.115	-0.254	16.294	0.003
			5	-0.058	-0.198	16.422	0.006
			6	-0.066	-0.169	16.594	0.011
			7	-0.294	-0.231	20.128	0.005
			8	-0.379	-0.135	26.282	0.001
			9	-0.260	0.060	29.325	0.001
			10	-0.312	0.029	33.919	0.000
			11	-0.409	-0.179	42.255	0.000
			12	-0.204	-0.004	44.460	0.000

	Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
UER			1	-0.209	-0.209	1.3636	0.243
			2	-0.131	-0.182	1.9143	0.384
			3	-0.266	-0.364	4.2917	0.232
			4	0.354	0.198	8.6875	0.069
			5	-0.093	-0.083	9.0054	0.109
			6	-0.117	-0.171	9.5254	0.146
			7	0.069	0.187	9.7186	0.205
			8	0.098	-0.026	10.124	0.256
			9	-0.003	0.027	10.125	0.340
			10	-0.221	-0.089	12.408	0.259
			11	0.093	-0.044	12.838	0.304
			12	0.095	0.079	13.316	0.347
PSI			1	-0.363	-0.363	4.1036	0.043
			2	-0.269	-0.462	6.4381	0.040
			3	0.189	-0.177	7.6419	0.054
			4	-0.014	-0.169	7.6487	0.105
			5	-0.146	-0.263	8.4304	0.134
			6	0.051	-0.268	8.5299	0.202
			7	0.154	-0.093	9.4730	0.220
			8	0.034	0.132	9.5207	0.300
			9	-0.082	0.202	9.8185	0.365
			10	-0.102	0.050	10.303	0.414
			11	0.039	-0.007	10.378	0.497
			12	0.058	0.057	10.556	0.567
GDP			1	-0.280	-0.280	2.4369	0.119
			2	-0.240	-0.345	4.2963	0.117
			3	0.141	-0.056	4.9689	0.174
			4	-0.024	-0.089	4.9892	0.288
			5	-0.064	-0.080	5.1397	0.399
			6	-0.114	-0.231	5.6385	0.465
			7	0.061	-0.126	5.7883	0.565
			8	0.055	-0.077	5.9154	0.657
			9	-0.024	-0.039	5.9408	0.746
			10	-0.032	-0.090	5.9901	0.816
			11	0.073	-0.010	6.2562	0.856
			12	0.075	0.070	6.5537	0.886
INF			1	0.232	0.232	1.6194	0.203
			2	-0.075	-0.136	1.7963	0.407
			3	-0.257	-0.221	3.9438	0.268
			4	-0.088	0.020	4.2073	0.379
			5	-0.173	-0.219	5.2766	0.383
			6	0.117	0.169	5.7857	0.448
			7	0.135	0.031	6.4958	0.483
			8	-0.090	-0.244	6.8288	0.555
			9	-0.146	0.018	7.7560	0.559
			10	0.104	0.156	8.2541	0.604
			11	0.033	-0.107	8.3078	0.685
			12	0.100	0.161	8.8320	0.717

Source: Compiled by the authors using EViews software.

Table 6 reports that the F-statistic from the Bounds Test is 6.439538, which exceeds the upper bound critical values (I(1)) at all conventional significance levels (10%, 5%, 2.5%, and 1%). With three explanatory variables (k = 3), this result allows us to reject the null hypothesis of no cointegration among the variables. Therefore, it can be concluded that a long-run relationship exists among UER, PSI, GDP, and INF in the ARDL model. This finding justifies proceeding with the estimation of both short-run and long-run coefficients, as well as applying the Error Correction Model (ECM) to analyze the adjustment mechanism toward long-run equilibrium.

Bảng 6. Bound test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.439538	10%	2.72	3.77
k	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61

Source: Calculated by the authors using EViews

Table 7 presents the regression results based on the ARDL model and the Error Correction Model (ECM).

Table 7. Estimation Results

Variables	Coefficient	Std. Error	t-Statistic	Prob.
The dependent variable: UER. Long-Term Estimation Results				
PSI	-0.014265	0.044543	0.320245	0.0425
GDP	-0.246908	0.196652	1.255563	0.0253
INF	-0.731115	0.284949	-2.565774	0.0194
The dependent variable: D(UER). Short-Term Estimation Results				
C	0.710343	0.174207	4.077574	0.0007
D(UER(-1))	-0.326958	0.146270	-2.235309	0.0383
D(GDP)	-0.059567	0.033466	-1.779925	0.0920
D(GDP(-1))	-0.104989	0.039566	-2.653505	0.0162
D(INF)	-0.003982	0.010816	-0.368120	0.7171
CointEq(-1)*	-0.391601	0.086034	-4.551686	0.0002

Source: Calculated by the authors using EViews

The long-run estimation results indicate a significant relationship between private investment, economic growth, inflation, and unemployment rate. Specifically, the inflation variable has a negative coefficient of -0.7311, with a p-value of 0.0194, indicating an inverse relationship that is statistically significant at the 5% level. This finding is consistent with the traditional economic theory, which suggests that higher inflation is often associated with lower unemployment.

Economic growth also exhibits a negative long-run impact on unemployment, with a coefficient of -0.2469 and a p-value of 0.0253, implying that economic expansion contributes to a reduction in unemployment through increased output and labor demand. Notably, private investment also shows a negative coefficient of -0.0143, suggesting that an increase in private investment may help lower the unemployment rate, although the magnitude of the effect is relatively small.

In the short run, the model also reveals several statistically significant dynamics that affect changes in unemployment rate. The first-differenced lag of the unemployment variable has a coefficient of -0.3270 with a p-value of 0.0383, indicating the presence of an inherent adjustment process in unemployment and suggesting that the unemployment rate tends to return to its equilibrium level following short-term shocks.

Lagged GDP has a negative and statistically significant coefficient of -0.1049 ($p < 0.05$), reflecting the positive impact of economic growth on the labor market with a time lag. Although current GDP also shows a negative coefficient (-0.0596), it is not statistically significant, implying that the effect of economic growth on unemployment may take time to materialize.

By contrast, inflation does not have a significant short-run effect on unemployment, suggesting that the relationship between these two variables is more pronounced in the long run.

Importantly, the error correction term (ECT) has a coefficient of -0.3916 and is highly statistically significant, confirming the existence of a long-run cointegrating relationship among the variables. The estimated adjustment speed of 39.16% per period indicates that the deviations from the long-run equilibrium are partially corrected for each cycle. This finding reinforces the validity and robustness of the ARDL model in capturing the dynamic interplay between private investment, economic growth, inflation, and unemployment in Vietnam.

Table 8. Diagnostic Test Results

Test	P-Value	Results
Normality test	0.4949	The residuals follow a normal distribution.
Breusch-Godfrey Serial Correlation LM Test	0.3140	No autocorrelation
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.9146	No heteroskedasticity

Table 8. Diagnostic Test Results

Test	P-Value	Results
Ramsey Reset Test	0.1986	No need for additional variables

Source: Calculated by the authors using EViews

Table 8 presents the results of the diagnostic tests used to assess the goodness-of-fit and reliability of the estimated model.

First, the normality test yielded a p-value of 0.4949, which exceeded the 5% significance threshold, indicating that the model's residuals followed a normal distribution, which is an essential condition for the validity of statistical inference.

Next, the Breusch-Godfrey LM test showed a p-value of 0.3140, suggesting no evidence of autocorrelation in the residuals.

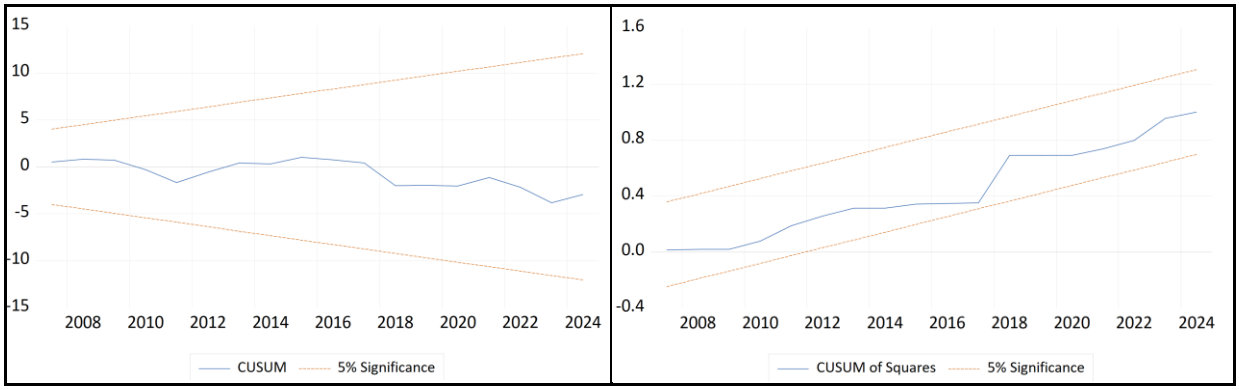
Additionally, the heteroscedasticity test produces a p-value of 0.9146, well above the 5% level, confirming the absence of heteroscedasticity, thereby supporting the consistency and efficiency of the estimated coefficients.

Finally, the Ramsey RESET test returned a p-value of 0.1986, indicating no statistical evidence of model misspecification or omitted variable bias. This result also implies that the functional form of the model was correctly specified.

Taken together, these diagnostic results demonstrate that the model meets key technical requirements, does not violate fundamental econometric assumptions, and is, therefore, robust and reliable for interpretation and policy analysis.

Finally, Table 9 presents the results of the CUSUM and CUSUM of Squares tests, which are two commonly used methods to assess the stability of the regression coefficients over time.

Table 9. CUSUM Test Results



Source: Calculated by the authors using EViews

Table 9 illustrates the results of the structural stability tests of the model using two plots: CUSUM and CUSUM of Squares.

For the CUSUM chart on the left, the test line fluctuated around the zero axis and remained entirely within the 5% significance boundary throughout the study period. This result indicates no evidence of parameter instability, confirming that the estimated coefficients are stable over time and are not subject to major structural shocks.

Similarly, the CUSUM of Squares plot on the right also shows that the test line stays within the 5% confidence bounds, although it approaches the lower boundary. This suggests that there is no significant evidence of time-varying error variance, and that the variance structure of the model remains stable.

Overall, both tests support the model's dynamic and structural stability, reinforcing the reliability of the estimated results and the forecasting capability of the model within the context of this study.

V. Conclusion

This study employs the ARDL model to assess the impact of private investment on the unemployment rate in Vietnam during 1996–2024. The empirical results confirm the existence of a cointegrating relationship between private investment, economic growth, inflation, and unemployment in the long run. Specifically, private investment has a negative effect on the unemployment rate, with a more pronounced impact in the long term. Although the short-run coefficients are relatively weak and not statistically significant at high levels, the

error correction term is highly significant, confirming the labor market's inherent ability to adjust back to the long-run equilibrium following short-term shocks.

This finding is consistent with previous studies, such as Okorie and Allison (2022) in Nigeria and Sami (2025) in North Africa, which demonstrate that private investment significantly reduces unemployment, particularly in the long run. Similarly, the study by Dabla-Norris et al., (2015) on emerging Asian economies affirmed the positive role of private investment in improving labor market outcomes, while emphasizing the importance of a transparent and conducive institutional environment as a prerequisite for such effects. In contrast, the present study makes a distinct contribution in the context of Vietnam, a developing country whose labor market still faces several structural challenges, including a high prevalence of informal employment and persistent skill mismatches.

A notable finding of this study is the confirmation of the important role of economic growth in reducing unemployment in both the short- and long-run, which aligns with the logic of Okun (1962) and the empirical evidence provided by Kitov (2021). However, unlike some studies, such as Cao et al., (2025) in Saudi Arabia and Ahamed (2021) across a group of 39 developing countries, where inflation plays a dominant role in determining unemployment, this study finds that the impact of inflation on unemployment in Vietnam is primarily evident in the long run, while short-run effects are statistically insignificant. This discrepancy may stem from Vietnam's relatively stable price control mechanisms or fiscal and monetary policy interventions that mitigate the immediate effects of inflation on the labor market.

In addition, compared to domestic studies such as Dao et al., (2023) and Demombynes and Testaverde (2018), which primarily focus on foreign direct investment (FDI) and the structure of formal employment, this study delves into the relationship with domestic private investment, an increasingly pivotal factor in Vietnam's economic development. Accordingly, this study fills an important empirical gap by simultaneously analyzing the interaction of three key policy variables–private investment, economic growth, and inflation–in relation to the unemployment rate.

In conclusion, this study demonstrates that when properly encouraged and supported, the private sector can serve as a key driver in promoting sustainable employment, reducing unemployment, and fostering economic development. The findings offer valuable insights for policymakers in designing strategies to support private enterprises while maintaining macroeconomic stability, thereby contributing to the achievement of the United Nations Sustainable Development Goal 8 on unprecedented work and inclusive economic growth."

VI. Policy Implications

The findings of this study confirm that private investment has a positive impact on employment and unemployment in Vietnam, particularly in the long run. This not only reinforces the strategic role of the private sector in the national economy but also highlights the need for practical policy interventions to fully unlock its potential in promoting sustainable job creation. Based on the research results, the following policy implications are proposed.

First, policies that incentivize private investment are enhanced, especially in sectors with high job creation potential. The government should provide tax incentives, access to credit, and technical assistance to encourage private enterprises to invest in key areas, such as manufacturing, high technology, agri-tech, and digital services. These sectors offer strong employment spillovers and high value-added potential, aligning with Vietnam's growth model transformation strategy.

Second, it improves market-oriented institutional frameworks and enhances the investment climate. Both the findings of this study and the international literature indicate that the effectiveness of private investment largely depends on institutional quality. Therefore, continued administrative reforms are essential, especially in streamlining and increasing transparency in investment licensing procedures, minimizing informal costs and legal risks, and strengthening investor confidence, both domestic and foreign.

Third, employment creation goals are integrated into private sector development strategies. The government should guide private enterprises not only to pursue profit but also to contribute to shared value creation through commitments to job creation, vocational training, and the development of local human resources. This approach is consistent with principles of inclusive and sustainable development.

Fourth, flexible inflation control policies are implemented to support the labor market. This study reveals an inverse relationship between inflation and unemployment in the long run. Accordingly, monetary policy should be managed prudently, not only to ensure price stability, but also to foster favorable conditions for economic growth and job creation.

Fifth, we established a monitoring and evaluation mechanism to assess the impact of private investment on employment. Regular tracking of key indicators related to private investment and unemployment will enable timely identification of policy gaps and facilitate more flexible adjustments. It is also essential to strengthen analytical capacity, labor statistics, and data systems disaggregated by sector, region, and demographic groups to support evidence-based policymaking.

Overall, the above policy implications highlight the need for a comprehensive and coordinated approach that combines support for the private sector, macroeconomic stability, and institutional quality improvement. Only through such an integrated policy framework can private investment truly serve as a driving force for sustainable job creation, unemployment reduction, and the successful realization of Vietnam's socioeconomic development goals for the 2021–2030 period.

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